



United States
Department of
Agriculture

Economic
Research
Service

Agriculture
Information
Bulletin
Number 531

September 1987

Price Parity

An Outdated Farm Policy Tool?

Lloyd Teigen

USDA
NAT'L AGRIC LIBRARY
1988 SEP -9 P 4: 37
CURRENT SERIAL RECORDS
ACQ/SERIALS BRANCH

Changes in the structure of agriculture and the distribution of income among producers make parity prices obsolete indicators of farmer well-being. The major shortcomings of the current parity price concept could be resolved by adjusting the parity price formula to reflect farm productivity gains, redefining base period prices, and treating interest in a different manner. Direct lump-sum payments, while avoiding the problems caused by price-enhancing policies, could increase the number of farms receiving income parity, especially in the lower commercial sales classes.

Parity is an equity concept rooted in the desire for fair and just treatment of agriculture in relation to the rest of the economy. Price parity, in particular, has influenced Federal farm legislation for more than 50 years. But the fairness of past relationships, which fit the 1930's when parity was legislated, is absent in the 1980's. This parity policy, appropriate when 6 million farms provided more than 33 percent of national employment, is less appropriate today when 2.2 million farms provide only 3 percent of national employment. Moreover, most farm output is grown on the largest half million farms that are able to prosper even with market prices registering below 50 percent of parity.

A *parity price* gives a commodity unit, such as a bushel of wheat or a pound of poultry, the same purchasing power that it had in the 1910-14 base period. *Parity income* compares the income of farm families with that of nonfarm families and is attained when farmers are able to achieve the same standard of living as others in the economy. Early farm programs sought to achieve income parity by supporting the prices of individual commodities on the basis of their calculated parity price.

Alternatives explored in this report would change the parity price formula by changing how interest is treated in the parity formula, by adjusting the parity index to reflect farm productivity gains since 1910-14, and by redefining adjusted base prices. Lump-sum payments to producers, rather than parity-based price supports, could broaden the distribution of income parity.

PARITY PROBLEMS

Parity prices and the parity index indicate price relationships. They do not indicate farmer well-being, net income, nor production costs. They merely show how current prices relate to those in 1910-14. They are reference prices which contain built-in biases ensuring that parity prices increase more rapidly than farm commodity prices. Thus, they are not useful for judging whether current market prices may be deviating from underlying trends simply because of weather or shortrun demand aberrations. Nor do they make appropriate reference points for administering programs. Here's a look at some of these problem biases along with possible solutions.

Productivity Changes

Problem: The current parity formula disregards changes in the farm sector since the base period. Farms are larger and more productive than they were 75 years ago. Corn yields are quadruple the 1910-14 level, and cows produce more than three times as much milk. The average corn farm produces more than 21 times the corn produced per farm in 1910-14, and cotton farms produce 44 times the 1910-14 average. The number of farms and farm employment, which remained fairly stable for the first half of the 20th century, have dropped to about one-third the 1945 level. Farm productivity has increased more rapidly than nonfarm productivity for as long as a USDA multifactor productivity index has been reported.

HOW PARITY WORKS

The *parity index*, also called the *index of prices paid by farmers (1910-14 base)*, measures the level of prices farmers pay for goods, services, interest, taxes, and wage rates, in relation to the level which prevailed in 1910-14. It is currently used in formulas that determine support prices for shorn wool, tobacco, and peanuts. Permanent legislation, which is put in abeyance by the current farm act (The Food Security Act of 1985), also would require its use in determining price supports for dairy products, wheat, cotton, and feed grains if temporary legislation expires. The terms parity index and index of prices paid are used interchangeably (fig. 1).

A corresponding *index of prices received* by farmers for farm products is used to develop a *parity ratio*. (USDA also publishes indexes of prices paid and received by farmers with 1977 as the base year. Unless the 1977 base is explicitly referred to, a parity discussion refers to the 1910-14 base). The parity ratio is the ratio of the index of prices received to the index of prices paid, where the base period for both is 1910-14, and is what is referred to when prices are said to be "XX percent of parity." In January 1987, the parity ratio stood at 50 percent before adjustment for commodity program payments, and at 57 percent after adjustment for payments received by farmers under commodity price support and land diversion programs (fig. 2).

Virtually every U.S. agricultural commodity has a parity price, which is the product of the parity index in the current month and the *adjusted base price* for the commodity. A commodity's adjusted base price is the ratio of the 10-year average price farmers actually received for the commodity to the 10-year average of the prices received index. A commodity's parity price differs from its recent 10-year average by the extent that the current parity index differs from the 10-year average of the index of prices received.

A Parity Comparison

An example from outside agriculture illustrates the difficulty of judging profitability by examining prices alone. In 1915, a 3-minute phone call from New York to Los Angeles cost \$22.20. To provide the same purchasing power today, that same call would have to cost \$245. Instead, that call (based on AT&T's daytime rate as of July 1, 1987) can be made for \$0.98. Yet, the telephone industry is sound, profitable, and healthy—without parity prices.

Figure 1

Prices Paid by Farmers Outpace Prices Received

Percentage of 1910-14 base

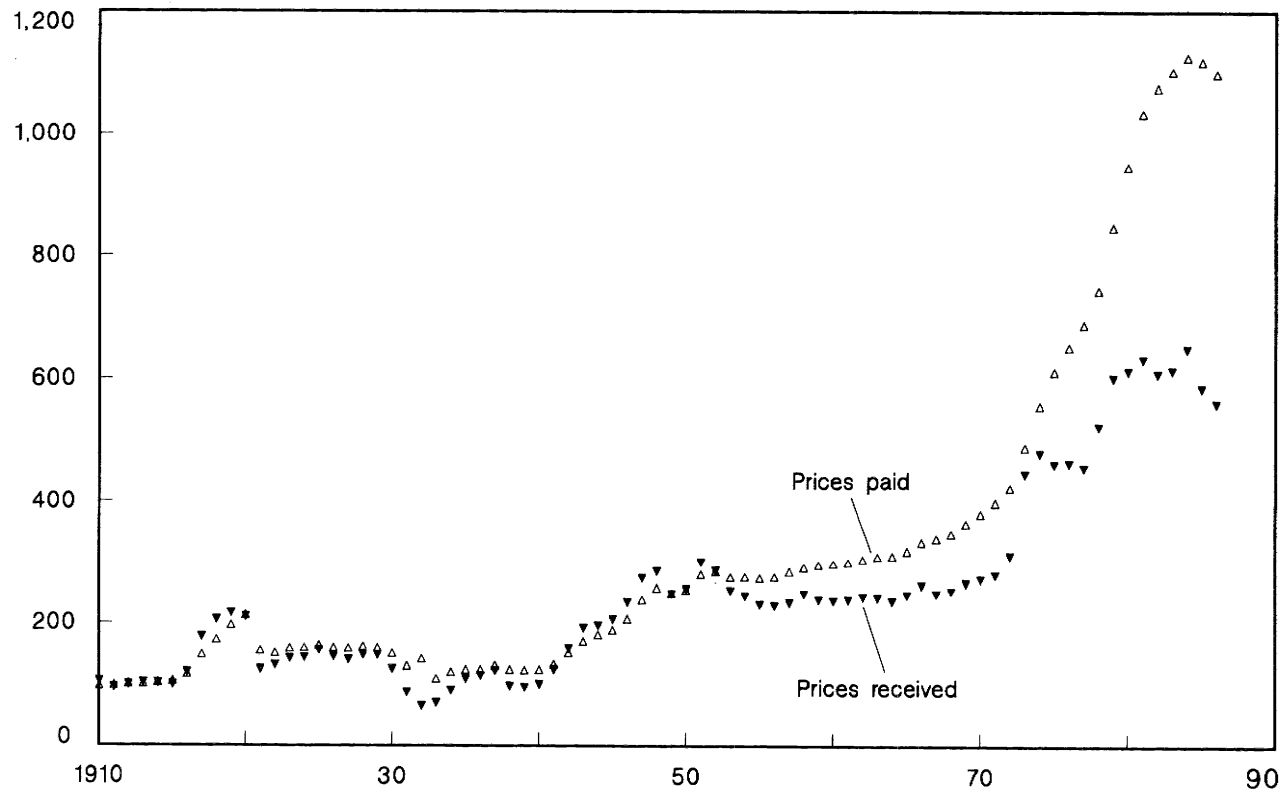
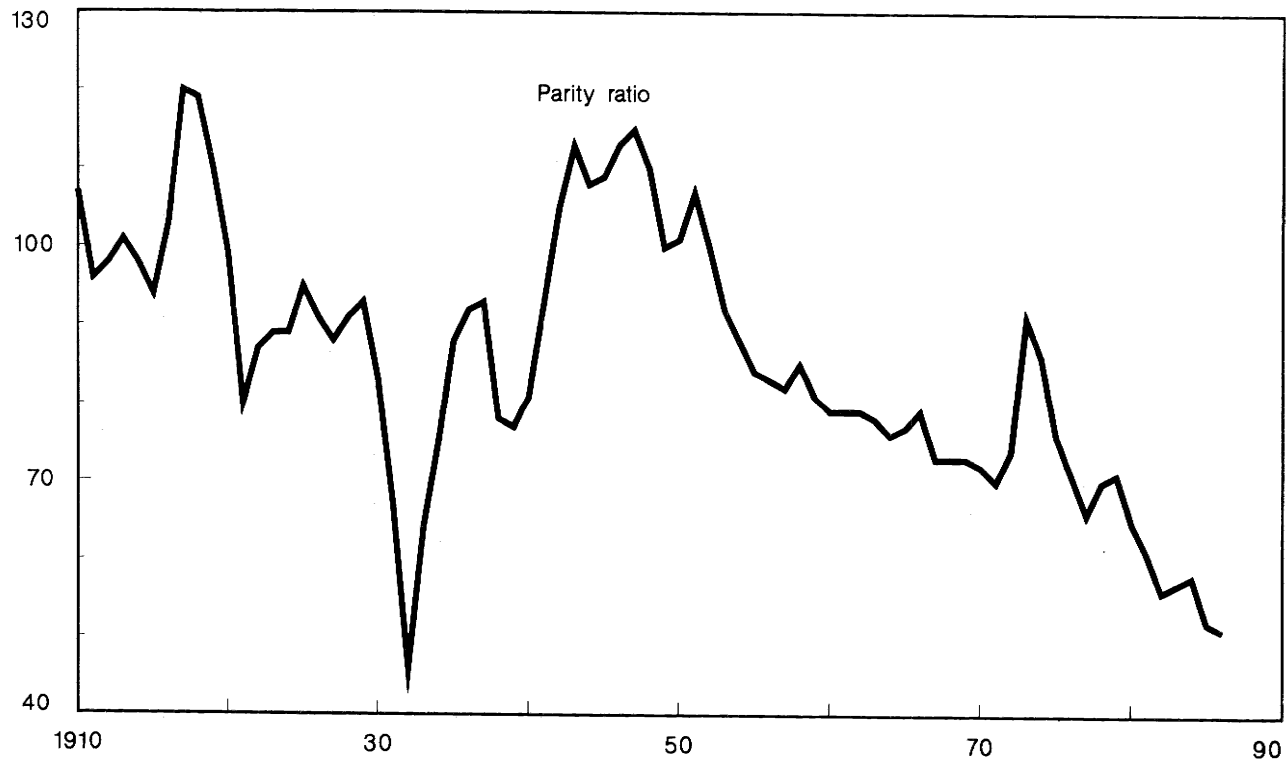


Figure 2

The Parity Ratio Has Been Falling for 75 Years

Percentage of 1910-14 parity



Larger, more specialized farms (reflecting a changing agricultural structure) and productivity gains have pushed the average household income of farm operators, including incomes from off-farm sources, above the median income of U.S. families since 1963. In 1983, the average total income of farm operator families was 118 percent of the median income of U.S. families. Thus, the farm sector, on average, has achieved income parity, although some individuals within the sector fall short, particularly those farmers selling less than \$100,000 of products.

Solution: Adjust the parity index according to farm productivity gains so that it will more accurately show the terms of trade between farm resources and the nonfarm economy. Farm sector output and productivity data extend back to the base period for the parity index, while nonfarm data extend only to 1948. Deflating the current parity index by a multifactor productivity measure results in an index that measures the price of the inputs needed to produce one unit of today's output. With farm productivity registering 2.9 times its level in 1910-14, a deflated index would be about 34 percent of the current parity index. Thus, prices received would be more accurately measured at about 150 percent of the 1910-14 terms of exchange, rather than 50 percent of parity under the current measure (fig. 3).

Interest Component

Problem: The interest component of the parity formula is too broadly defined. A bias results from calculating the interest component of the parity index as payments per acre of farm real estate (fig. 4). Thus, the index reflects both price and quantity dimensions. Although the index increases when interest rates rise, it also increases when other factors change, such as when the amount of land being mortgaged increases, when the downpayment fraction of land value drops, and when the value of land being put under mortgage rises. These quantity factors have pushed the interest component of the parity index to 3,616 percent of the 1910-14 base, while farm interest rates are only about 200 percent of 1910-14 levels. Moreover, in contrast with earlier laws, the 1948 definition of the parity index referred explicitly to interest rates, rather than interest payments per acre.

Solution: Reflect only interest rates in the parity index. This change could better reflect the price of borrowed capital in the parity index. It would substitute a component registering about 200 for one which currently exceeds 3,600 percent of 1910-14 levels. This interest revision would drop the overall parity index from values near 1,100 percent of the 1910-14 base to values between 900 and 1,000.

Index Differences

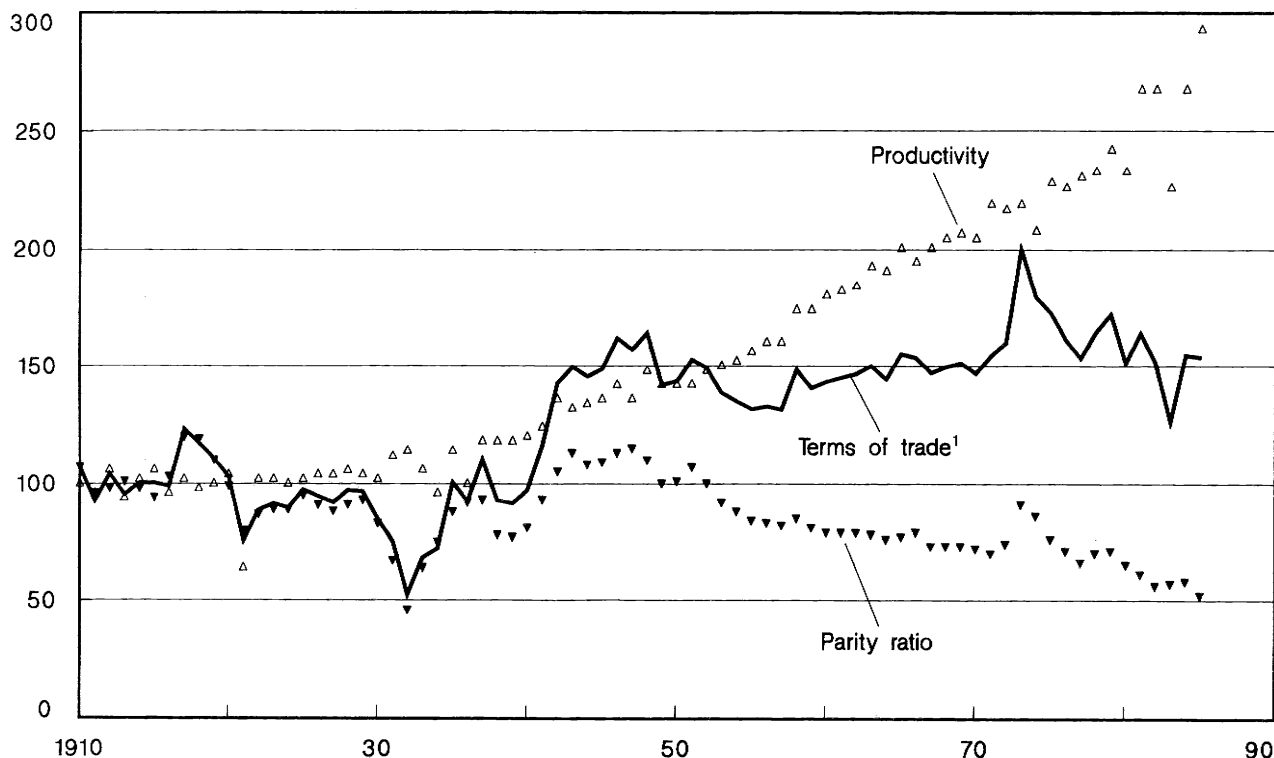
Problem: Index differences in the adjusted base price definition move parity prices away from market prices. The definition of the adjusted base price, introduced in 1948, links parity prices to a 10-year moving average of commodity prices. That link is the ratio of the current parity index (or prices paid index) to the 10-year average of the prices received index. The parity index responds to different factors than does the index of prices received, causing the two to change at different rates and to seek different levels. Moreover, the 10-year average responds to market conditions much slower than does the current month's parity index. Even with a very slow rate of price inflation, including some price deflation, the current month's parity index will exceed the 10-year average of the index.

Competitive market conditions moderate the prices received index by translating excess supply into falling farm prices, often in nominal as well as real terms. The prices paid index increases faster than the prices received index because of the different market structure for farm inputs, the input industry's greater market power, and other

Figure 3

Rising Productivity Offsets Falling Parity Ratio, Pushing Terms of Trade to 150 Percent of 1910-14

Percentage of 1910-14 base



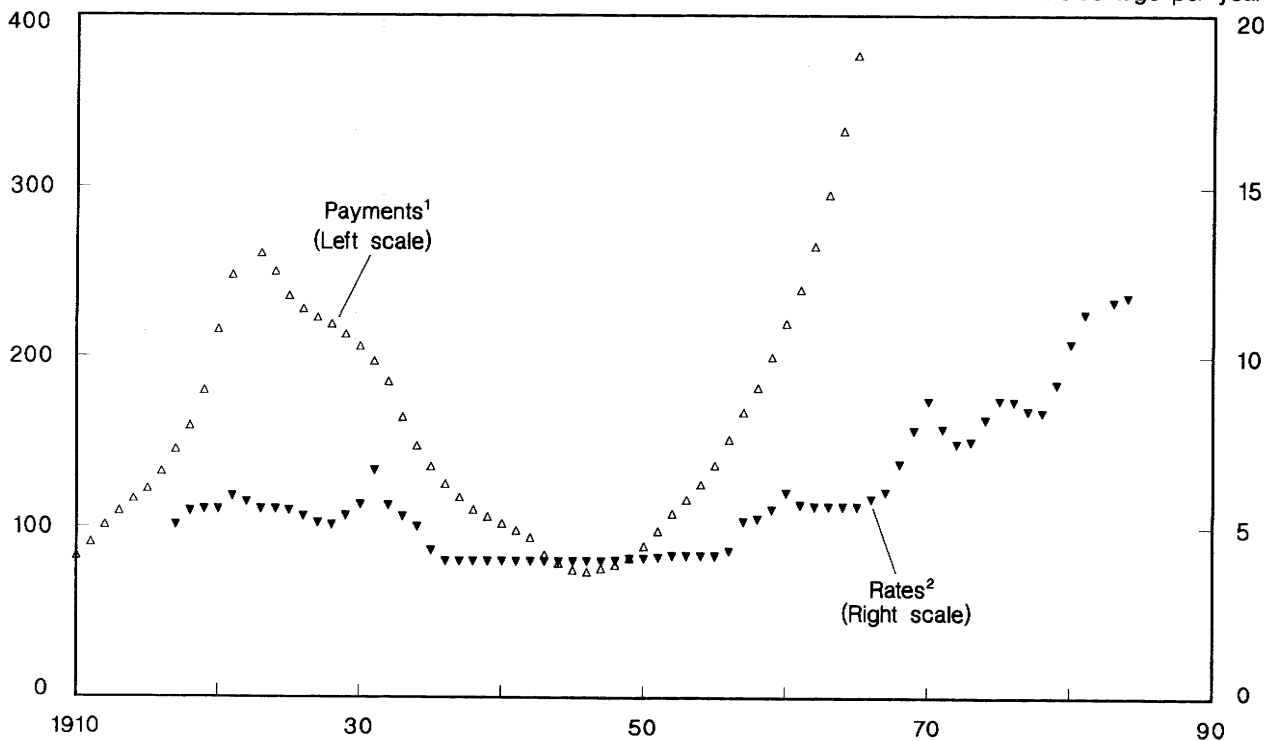
1/ The terms of trade index is the product of the parity ratio and the productivity index.

Figure 4

Factors Other than Interest Rates Push Interest Payments Out of Sight

Percentage of 1910-14 base

Percentage per year



1/ Interest payments per acre. This index reached 4,370 in 1983; plotting data since 1967 would obscure earlier variation by compressing the scale.
2/ Interest rate on Federal land bank new loans.

factors. Parity price consequently moves away from the price received by farmers for a commodity at a rate equal to the difference in the two rates of increase.

Solution: Define the adjusted base price concept in terms of the prices paid index. An alternative definition would link parity prices more closely to actual commodity prices. If the adjusted base price were defined as the 10-year average commodity price deflated by the 10-year average of the prices paid index (rather than prices received), today's parity prices would be much lower, although parity prices in 1948-56 would have been higher (fig. 5). By about 1956, after the WW-II price levels worked through the averages, parity prices based on the current definition began to diverge significantly from what they would have been if the proposed definition were used. This modification would have reduced parity prices to 120 percent of the 10-year average commodity price in 1985 from 194 percent under the present definition. Thus, changing the definition of the adjusted base price by dividing the average commodity price by the prices paid index would keep parity prices more responsive to the current situation.

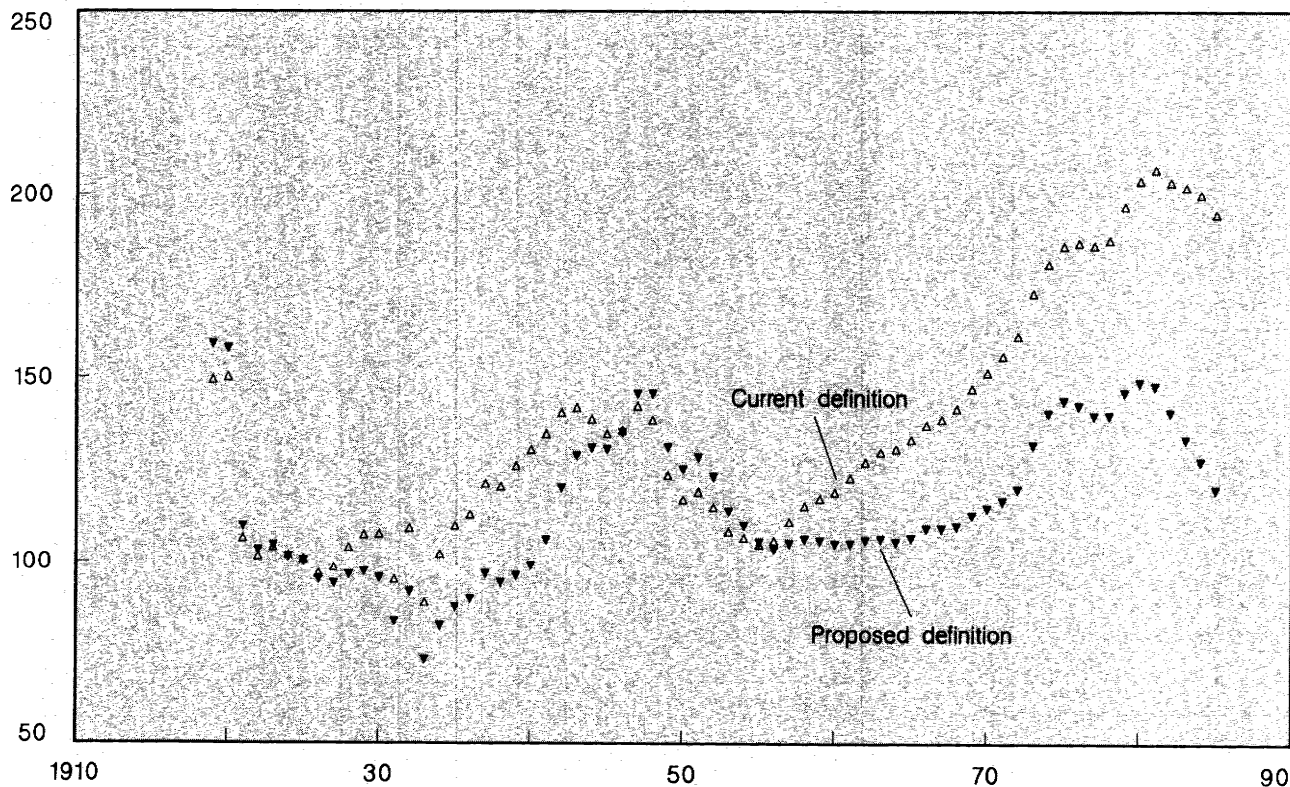
PARITY INCOME

Achieving income parity requires more than simply raising farm product prices. Higher prices have little effect on the income of those farm operators who have little to sell. Raising prices to remedy the income shortfalls of smaller farmers means that larger farmers also receive the extra income even though their incomes already exceed that of the median U.S. family. Income gains can be measured by the percentage increase in total family income resulting from a 1-percent increase in the prices received for farm products (fig. 6). A 1-percent increase in the price of all farm products would raise incomes of farms with sales greater than \$20,000 by 2-5 percent, but would raise the incomes of farms with less than \$10,000 sales by less than a half a percent.

Figure 5

The Parity Price Is a Multiple of the Commodity's 10-year Average Price

Percentage of average



Operators on farms with sales greater than \$100,000 realize more total income than the median U.S. family. But, farms with \$40,000–\$99,999 worth of sales have not done so since 1980. The largest shortfalls from median U.S. family income have occurred mostly on farms with \$20,000–\$39,999 in sales. These shortfalls have ranged between \$8,000–\$10,000 per farm family each year. A simple means to broaden the distribution of farms achieving income parity would be to make a lump-sum payment to all farms falling short of the goal. For example, a \$10,000 payment to every farm with sales less than \$100,000 would cost about \$19 billion each year, and would assure, on average, income parity for all farms. In contrast, the farm commodity programs of the 1985 Food Security Act cost \$26 billion during 1986, with about 75 percent of that going to farms with sales greater than \$100,000.

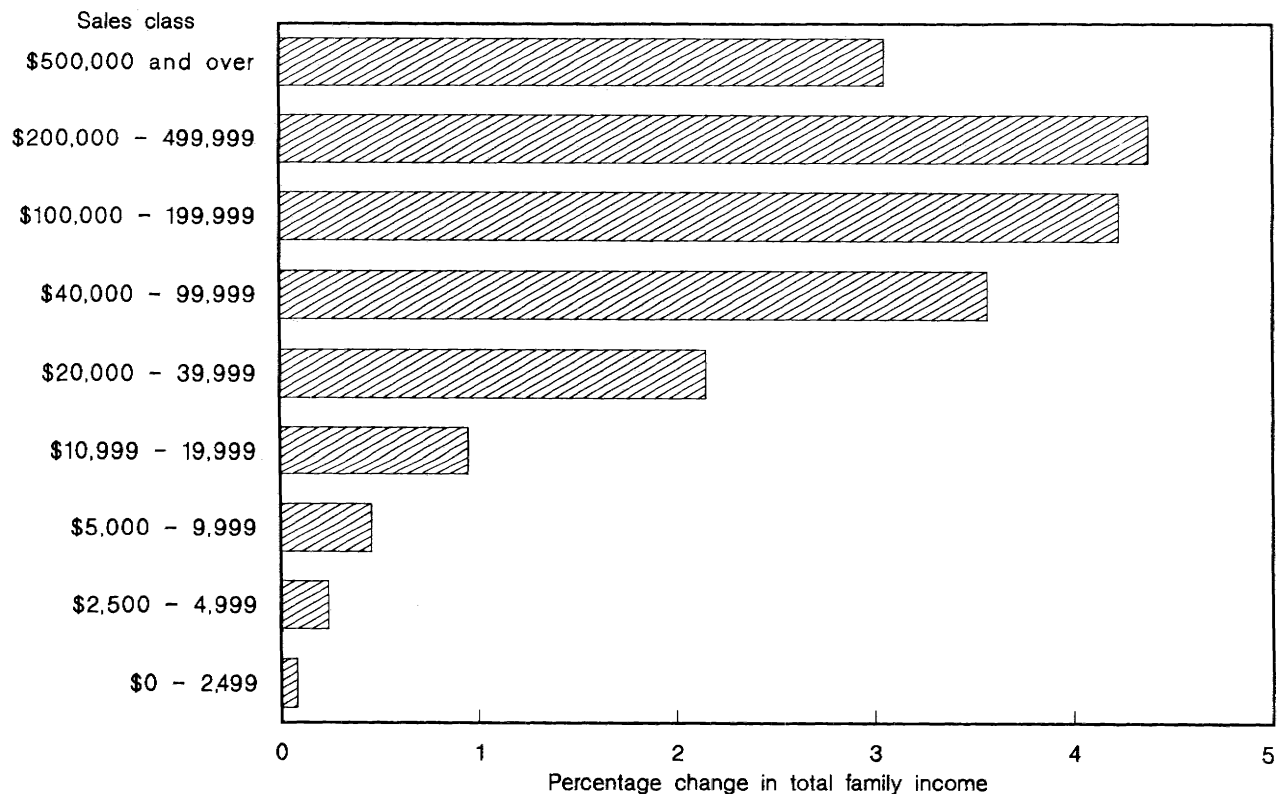
Price enhancement increases the income of farmers, but widens the disparity of income among farmers. Farms that have already surpassed income parity benefit the most from price enhancement. Directed lump-sum payments also increase the incomes of farmers, but let more farmers achieve income parity.

* * * * *

Parity prices were designed to help farmers achieve parity income. But, the means has taken on a life of its own and the end has been all but forgotten. Significant defects in the way parity prices are calculated have eroded the usefulness of parity prices as Federal farm policy instruments. Fixing these defects would make the parity price formula work better. Even then, the parity price is only an instrumental means, and not the goal, of farm policy.

Figure 6

Large-Farm Income Responds More to a 1-Percent Price Increase than Does Small-Farm Income



UNITED STATES DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE
1301 NEW YORK AVENUE, NW.
WASHINGTON, D. C. 20005-4788

The higher issues of farm policy remain unresolved: Are farm incomes out of balance with the rest of society? Should farm incomes be augmented? Should income be enhanced through price increases, or by other means?

Price policy, influencing only the farm income resulting from cash sales of federally supported commodities, slants benefits toward farmers with the largest incomes. Income policy, focusing on achieving income parity within commercial agriculture, requires decisions reaching beyond the 1910-14 price parity issue.

FOR ADDITIONAL INFORMATION...

Contact Lloyd Teigen (202) 786-1780, Agriculture and Trade Analysis Division, Economic Research Service, U.S. Department of Agriculture, Room 924, 1301 New York Avenue, NW., Washington D.C., 20005-4788. A more detailed report, "Agricultural Parity: Historical Review and Alternative Calculations" is available from the U.S. Government Printing Office. Call (202) 783-3238 for ordering information.

Current debate on farm policy is based on conflicting reactions to the 1985 Food Security Act. A decision made on behalf of one group may have unanticipated or adverse effects on others. These bulletins are part of a series published by USDA's Economic Research Service aimed at informing those debating farm policy about the highly interrelated nature of agricultural policymaking. For more information on upcoming bulletins, write to USDA-EMS Information, Room 237, 1301 New York Avenue, NW., Washington, DC 20005-4788.

- o *Choices for Implementing the Conservation Reserve* (AIB-507)
- o *Assistance to Displaced Farmers* (AIB-508)
- o *Economic Growth, Agricultural Trade, and Development Assistance* (AIB-509)
- o *New Approaches to Financing Long-Term Farm Debt* (AIB-511)
- o *Paying for Marketwide Services in Fluid Milk Markets* (AIB-514)
- o *Increased Role for U.S. Farm Export Programs* (AIB-515)
- o *Trade Liberalization in World Farm Markets* (AIB-516)
- o *Effects of Monetary and Fiscal Policy on U.S. Agriculture* (AIB-517)
- o *Challenges in Designing U.S. Farm Policy* (AIB-518)
- o *Mandatory Production Controls* (AIB-520)
- o *Redistributing Farm Program Benefits* (AIB-522)
- o *The Policy Web Affecting Agriculture* (AIB-524)
- o *Price Parity: An Outdated Farm Policy Tool?* (AIB-531)